MIRAI MR98-K02 Expendable Conductivity-Temperature-Depth Profiler (XCTD)

Last Modified: 2019-08-28

ReadMe | Observation Data | Data Format

Cruise ID: MR98-K02
Expendable Conductivity-Temperature-Depth Profiler (XCTD): Processed (DMO)-QCed
Data Policy: JAMSTEC
Observation Items: Depth, Temperature, Salinity
Science Keywords:

OCEANS > OCEAN TEMPERATURE > WATER TEMPERATURE
OCEANS > SALINITY/DENSITY > SALINITY

Cruise Report
http://www.godac.jamstec.go.jp/catalog/data/doc_catalog/media/MR98-K02_all.pdf

For Using Data

Principal Investigator
Data Management Office

Use Constraints
See Terms and Conditions about constrain of use.

Data Citation
See Terms and Conditions about data citation.

Instrument

Instrument:
Expendable conductivity temperature depth measurements (XCTD) (- MR11-E02)

Overview

Using XCTD (eXpendable Conductivity Temperature Depth profiler) system, the vertical distribution of water temperature and salinity are observed during free fall of its probe part in the seawater. Observed temperature and conductivity are transmitted to the data processor on board by the digital signal. The digital signal is converted to the temperature, conductivity and depth by data processor as binary data. Binary data is transmitted from data processor to PC. The PC calculates salinity from temperature, conductivity and depth, and those properties are recorded in PC as the ASCII files.

System

(1) Launcher

Hand launcher

Manufacturer : Sippican,Inc.
Operation area : Rear upper deck

Automatic launcher

Manufacturer : Tsurumi Seiki Co., LTD.
Location : Port side of rear upper deck (4m from the sea level). The control panel is installed in the investigation room.

(2) Converter

Manufacturer : Tsurumi Seiki Co., LTD.
Location : Investigation room
Sampling rate : 40 msec

(3) XCTD probe specifications

Probe Type	TSK XCTD-1	TSK XCTD-2	TSK XCTD-3	TSK XCTD-4
Temperature range [deg-C]	-2 to 35			
Temperature accuracy [deg-C]	+/- 0.02			
Temperature resolution [deg-C]	0.01			
Conductivity range [mS/cm]	0 to 60			
Conductivity accuracy [mS/cm]	+/- 0.03			
Conductivity resolution [mS/cm]	0.015			
Measurment depth [m]	1000	1850	1000	1850
Depth accuracy [m]	5 or +/- 2% of depth; whichever is larger			
Maximum elapsed time [sec]	300	600	200	502
Rated ship speed [knot]	12	3.5	20	6

Since XCTD carries no pressure sensor, we need to estimate depth from the elapsed time. The fall-rate equation is as follows.

$$Z = at + 10E^{-3} * bt^{2}$$

Where Z(m) is the depth and t(sec) is the elapsed time.

In addition, coefficients of the fall-rate equation are different by probe types.

Probe Type	TSK XCTD-1	TSK XCTD-2	TSK XCTD-3	TSK XCTD-4
Coefficient-a	3.42543	3.43898	5.07598	3.68081
Coefficient-b	-0.47	-0.31	-0.72	-0.47

* Coefficients listed above are supplied by Sippican, Inc., in USA.

The list of an XCTD type used in each cast is as follows.

Cast name	Probe Serial No.	Probe Type	Launcher	Converter
199901051305	98112219	XCTD-1	-	MK-100
199901060051	98112225	XCTD-1	-	MK-100
199901061203	98112218	XCTD-1	-	MK-100
199901070002	98112224	XCTD-1	-	MK-100
199901081203	98112213	XCTD-1	-	MK-100
199901082350	98112220	XCTD-1	-	MK-100
199901092352	98112215	XCTD-1	-	MK-100
199901101102	98112212	XCTD-1	-	MK-100
199901102303	98112217	XCTD-1	-	MK-100
199901121103	98112211	XCTD-1	-	MK-100
199901122250	98112209	XCTD-1	-	MK-100
199901131109	98101923	XCTD-1	-	MK-100
199901132250	98101926	XCTD-1	-	MK-100
199901140959	98102159	XCTD-1	-	MK-100
199901142204	98102161	XCTD-1	-	MK-100
199901160917	98102170	XCTD-1	-	MK-100

Data processing

(1) For sensor's stablility, values of less than 1 m for temperature and less than 3 m for salinity are replaced by missing values, respectively, based on manufacturer's recommendation.

(2) Quality control

QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure.

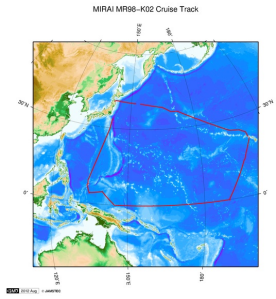
1) The gradient check of adjacent depth data
2) The density inversion check
3) The broad range check set up at given ocean space and depth

Please see the site of NODC of the following link for quality control procedure in detail.

QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA

In addition, an abnormal value is identified by a visual check, and the data after visual QC is released.

Related Information



Enlarge Image

MR98-K02
Ship Name: MIRAI
Period: 1998-12-22 - 1999-01-31
Chief Scientist: Takeshi Kawano (JAMSTEC)

Update History

2019-08-28	An observation data was registerd.
2017-06-14	An observation data was registerd.
2014-07-12	An observation data was registerd.
2014-02-18	An observation data was registerd.
2013-01-25	An observation data was registerd.

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XCTD DMO

Format Description for the Corrected Data

Provided in the Exchange Format of CCHDO (CLIVAR and Carbon Hydrographic Data Office). Please see the following link for details of Exchange Format.

CCHDO | CLIVAR & Carbon Hydrographic Data Office

Data in following cruise is not expressed with Exchange Format. Please see the site of each cruise for format.

MR02-K05 Leg1

MR04-05

Format Description for the QCed Data

Each data file contains one line header (meta data) followed by data lines for each cast.

The number of data lines are recorded in the header.

Header part

No.	Column	Content	Format	Remarks
1	1	Header ID	a1	fixed as '#'
2	3 - 6	Data ID	a4	XCTD
3	8 - 22	Cruise ID	a15	
4	33 - 40	Date	i8	YYYYMMDD (UTC)
5	42 - 45	Time	i4	hhmm (UTC)
6	47 - 55	Latitude	i2,a1,f5.2,a1	dd-mm.mmN(S)
7	57 - 66	Longitude	i3,a1,f5.2,a1	ddd-mm.mmE(W)
8	68 - 71	Number of data lines	i4	
9	72 - 73	Terminator	-	CR+LF

Data part

No.	Column	Content	Unit	Format	Remarks
1	1 - 11	Depth	m	f11.1	
2	12 - 22	Temperature	deg-C	f11.2	ITS-90
3	23 - 33	Salinity	PSU	f11.3	PSS-78
4	45 - 55	Flag	-	i11	1 - 7 : space 8 : flag of depth 9 : flag of temperature 10 : flag of salinity 11 : space * reference : 'Definition of Quality Control Flags'
5	56 - 57	Terminator	-	-	CR+LF

Each contents of the data part is stored in 11 bytes.

Missing value is presented by '-5', and error value is presented by '-9'.

Definition of Quality Control Flags

1. Depth Flags
   - 0 - accepted value
   - 1 - error in recorded depth (same or less than previous depth)
   - 2 - density inversion

2. Observed Level Flags
   - N - missing value
   - 0 - accepted value
   - 1 - range outlier (outside of broad range check)
   - 2 - failed inversion check
   - 3 - failed gradient check
   - 4 - zero anomaly
   - 5 - failed combined gradient and inversion checks
   - 6 - failed range and inversion checks
   - 7 - failed range and gradient checks
   - 8 - failed range and zero anomaly checks
   - 9 - failed range and combined gradient and inversion checks
   - A - failed visual check

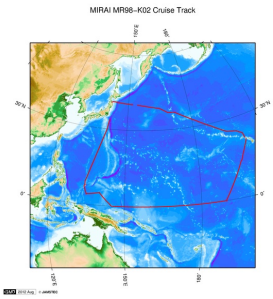
QCed data were added flag according to the NODC (National Oceanographic Data Center) quality control procedure, additionally visually checked. Please see the site of NODC of the following link for quality control procedure.

QUALITY CONTROL AND PROCESSING OF HISTORICAL OCEANOGRAPHIC TEMPERATURE, SALINITY, AND OXYGEN DATA

Sample Program

ex_read2.f

Related Information



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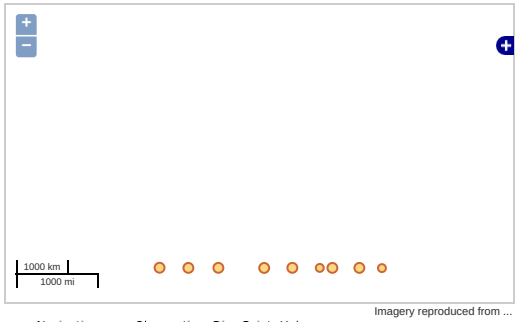
Observation Map

1. Clicking the icon displays a balloon with observation information.
2. Then click the observation name, figures will be displayed.

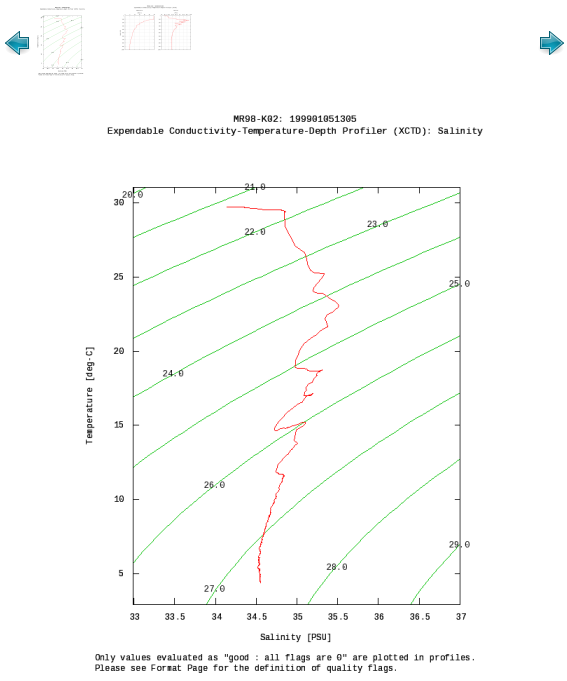


Imagery reproduced from ...

... Observation Line ... Navigation ... Observation, Dive Point, Hole

Figures

199901051305



Only values evaluated as "good : all flags are 0" are plotted in profiles.
Please see Format Page for the definition of quality flags.

Data List

Add to Basket

File names
199901051305.dat
199901060051.dat
199901061203.dat
199901070002.dat
199901081203.dat
199901082350.dat
199901092352.dat
199901101102.dat
199901102303.dat
199901121103.dat
199901122250.dat
199901131109.dat
199901132250.dat
199901140959.dat

Filenames

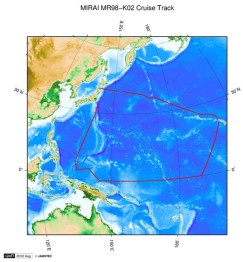
199901142204.dat
199901160917.dat
ex_read2.f (Sample Program)

- Observation List

The list of observation is shown as follows.

Observation	Time and Date	Lat. [°]	Lon. [°]
199901051305	1999-01-05 13:00	0.0280	150.3353
199901060051	1999-01-06 00:46	-0.0001	153.2444
199901061203	1999-01-06 11:57	0.0005	155.4533
199901070002	1999-01-06 23:57	0.0088	158.3466
199901081203	1999-01-08 11:58	0.0106	160.7788
199901082350	1999-01-08 23:45	0.0028	163.5853
199901092352	1999-01-09 23:46	-0.0090	168.9130
199901101102	1999-01-10 10:57	0.0101	171.1726
199901102303	1999-01-10 22:58	0.0128	173.9125
199901121103	1999-01-12 10:58	0.0000	176.1441
199901122250	1999-01-12 22:45	-0.0011	178.7825
199901131109	1999-01-13 11:03	0.0011	-178.9750
199901132250	1999-01-13 22:44	0.0010	-176.3145
199901140959	1999-01-14 09:54	-0.0013	-174.1840
199901142204	1999-01-14 21:59	-0.0006	-171.2543
199901160917	1999-01-16 09:12	-0.0400	-170.1746

Related Information



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JAPAN AGENCY FOR MARINE-EARTH SCIENCE AND TECHNOLOGY